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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY/DOCKET NO.	CONFIRMATION NO.
09/800,627	03/07/2001	Koichiro Tanaka	SEL 245	3352

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EXAMINER

THOMAS, TONIAE M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 01/03/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/800,627

Applicant(s)

TANAKA ET AL.

Examiner

Toniae M. Thomas

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4, 8, 12, 16, 20 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 8, 12, 16, 20 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is a first Office action on the merits of Application No. 09/800,627.

Currently, claims 1, 4, 8, 12, 16, 20, and 24 are pending.

Election/Restrictions

2. Applicant's election without traverse of the species of Group III (claims 1, 4, 8, 12, 16, 20, and 24) in Paper No. 12 is acknowledged. Claim 1 is generic. The amendment received on 15 October 2002 cancelled non-elected claims 2, 3, 5-7, 9-11, 13-15, 17-19, 21-23, and 25-52.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2822

4. *Claims 1, 4, 8, 12, 16, 20, and 24 are rejected under 35 U.S.C. 103(a) as being obvious over Maekawa (US 6,066,547 B1) in view of Kitakado et al. (US 6,461,899 B1).*

The applied reference, US 6,461,899 B1, has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Maekawa discloses a method of manufacturing a semiconductor device (figs. 4-11 and col. 5, line 24 to col. 8, line 3). The method comprises the following steps substantially as claimed: introducing a metallic element 24 for promoting crystallization of an amorphous semiconductor film into the amorphous semiconductor film 14 (fig. 8

Art Unit: 2822

and col. 6, lines 7-29); partially crystallizing the amorphous semiconductor film using a heat treatment to form a first polycrystalline semiconductor film (col. 6, lines 30-67); and annealing the first polycrystalline semiconductor film to form a second polycrystalline semiconductor film (col. 7, lines 1-18).

The metallic element may be one of nickel, palladium, and platinum (col. 6, lines 9-12 and 24-26).

The semiconductor device is a liquid crystal display (col. 5, lines 38-40).

Maekawa teaches that laser annealing may be used when annealing the first polycrystalline semiconductor film to form the second polycrystalline semiconductor film (col. 7, lines 47-49). However, Maekawa does not teach that the laser beam has a wavelength from 360 to 650 nm; or that the laser beam is selected from one of a second harmonic of a YAG laser, a second harmonic of a glass laser, an Ar laser, a second harmonic of an YLF laser, and a second harmonic of an YVO₄ laser. Instead, the laser annealing is performed using an excimer laser (col. 7, lines 47-49).

Furthermore, while the semiconductor device is a liquid crystal display, Maekawa does not teach that the liquid crystal display is part of a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book, or a portable information terminal.

Kitakado et al. disclose a method of manufacturing a semiconductor device, the method comprising a step of crystallizing an amorphous semiconductor film (col. 8, line 40 to col. 9, line 30). Kitakado et al. teach that a laser annealing may be used to crystallize the amorphous semiconductor film, wherein the laser beam may be one of an

Art Unit: 2822

excimer laser, an Ar laser, and the second harmonic of a YAG laser, an YLF laser, and an YVO₄ laser (col. 8, line 59 to col. 9, line 17). The second harmonic of a YAG laser, an YLF laser, and an YVO₄ laser has a wavelength of 532 nm, which is within the claimed ranges of 360 to 650 nm and 400 to 600 nm.

Kitakado et al. also teach forming a liquid crystal display, which may be incorporated into the following electronic devices: a portable telephone, a video camera, a digital camera, a projector, a personal computer, a DVD player, an electronic book, and a portable information terminal (figs. 24A-24F, 25A-25E, and col. 23, line 20 to col. 24, line 60).

One having ordinary skill in the art would have been motivated to modify Maekawa by using a laser beam, which has a wavelength from 360 to 650 nm, or preferably from 400 to 600 nm, and selecting the laser beam from one of a second harmonic of a YAG laser, an Ar laser, a second harmonic of an YLF laser, and a second harmonic of an YVO₄ laser, as taught by Kitakado et al., because of the following reasons: [1] a wavelength within the claimed range (e.g. the second harmonic of the YAG, YLF, and YVO₄ lasers, 532 nm) heats from the surface and from the interior of the semiconductor film (Kitakado et al. - col. 9, lines 10-17); and [2] a laser beam selected from one of a second harmonic YAG laser, an Ar laser, a second harmonic of an YLF laser, and a second harmonic of an YVO₄ may be used as an alternate, in place of an excimer laser, to perform the crystallization step.

A liquid crystal display device may be used in various electro-optical devices. One having ordinary skill in the art would have been motivated to modify Maekawa by

Art Unit: 2822

incorporating the liquid crystal display into one of a portable telephone, a video camera, a digital camera, a projector, a personal computer, a DVD player, an electronic book, and a portable information terminal, as taught by Kitakado et al., because an electro-optical device, which incorporates a liquid crystal display device, is used in these electronic devices as a display medium (Kitakado et al. - col. 23, lines 21-32).

Maekawa does not teach that [1] an area of each of amorphous regions in the first polycrystalline semiconductor film is equal to or less than $10.0 \mu\text{m}^2$, or [2] that an area of at least one of the amorphous regions is equal to or greater than $0.30 \mu\text{m}^2$. However, given the general process disclosed in the prior art, it would have been within the ability of one having ordinary skill in the art to discover the claimed area of the amorphous regions through routine experimentation. "Where general conditions of [a] claim are disclosed in prior art, it is not inventive to discover optimum or workable ranges by routine experimentation" (see *In re Aller, Lacey, and Hall* 105 USPQ 233 (CCPA 1955)). Therefore, the area of the amorphous regions is taken to be obvious over the combination of Maekawa and Kitakado et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (703) 305-7646. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/800,627

Page 7

Art Unit: 2822

JMJ

December 26, 2002


**AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
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